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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,685	11/07/2001	Jeremy Barker	VT-2230CPC	2404
33204	7590	05/20/2004	EXAMINER	
VALENCE TECHNOLOGY, INC. 301 CONESTOGA WAY HENDERSON, NV 89015			CHANEY, CAROL DIANE	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/045,685	<b>Applicant(s)</b> BARKER ET AL.	
	<b>Examiner</b> Carol Chaney	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 101-153 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 101-153 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Election/Restrictions***

Applicant's election of the species  $\text{Li}_a\text{V}_b(\text{PO}_4)_3\text{F}_d$  in Paper filed 02 March 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 101-109, 116-134, and 141-153 are rejected under 35 U.S.C. 102(b) as being anticipated by Shackle, US Patent 5,721,070.

Shackle discloses electrode active cathode materials used in lithium nonaqueous batteries. The battery compositions are represented by the formula



where

'M' is an alkali metal ion

'T' is a metal ion capable of existing in more than one stable oxidation state selected from Mn, Ni, Fe, V, Ti, Co, Cu, Cr, Sn, Pb, W, and Mo.

'A' is a multi-element anion with a charge greater than 1.0 and selected from  $\text{SiO}_4$ ,  $\text{TiO}_4$ ,  $\text{VO}_4$ ,  $\text{FeO}_4$ ,  $\text{MnO}_4$ , and  $\text{PO}_4$ .

(See column 3 line 61-column 4 line 36.)

'x' is between 1 and 20, 'y' is between 1 and 4, and  
z is from 1 to about 7.

(See column 8, lines 19-23.)

In addition, in some embodiments, further anions are added into the electrode active material compound to alter electrical conductivity. Typical added anions include  $\text{F}^-$  and  $\text{OH}^-$ . (See column 4, line 63-column 5, line 3.) Thus, lithium metal phosphates having hydroxide or fluoride anions are disclosed by Shackle as electroactive cathode materials, and batteries using the materials are taught by Shackle. (Column 5, lines 19-30.)

Claims 101-119, and 121-125 are rejected under 35 U.S.C. 102(b) as being anticipated by Rinaldi, "The crystal structure of griphite, complex phosphate not a garnetoid", *Bulletin de Mineralogie* (1978) **101**(5-6), 543-7.

The generic empirical formula for griphite is given as

$\text{Ca}(\text{Mn, Na, Li})_6\text{FeAl}_2(\text{PO}_4)_6(\text{F, OH})_2$  See:

<http://www.webmineral.com/data/Griphite.shtml>

This formula can be written alternatively in the format  $\text{A}_a\text{M}_b(\text{PO}_4)_3\text{Z}_d$  as

$(\text{Mn, Na, Li})_3\{\text{Fe}_{0.5}\text{Ca}_{0.5}\text{Al}\}(\text{PO}_4)_3(\text{F, OH})$  where

'A' is Mn, Na, Li and comprises alkali metals,

'M' is Fe, Ca, and Al or M' is Fe and M" is Ca and Al,

Z is F and OH.

The recitation of the adjective "electrode active" in the preambles of applicants' claims is not given patentable weight. The materials described by the prior art and the applicant are essentially the same; the terms used to describe the materials do not distinguish the materials.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 110-115, 135-140 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shackle, US Patent 5,721,070 in view of Kumta et al, US Patent 6,017,654.

As discussed above, Shackle discloses applicants' invention essentially as claimed, with the exception that Shackle does not specifically suggest a metal ion intercalation compound including two or more metal 'T' ions in the formula



Kumta et al. disclose lithiated transition metal compounds used as secondary lithium battery cathode materials. They teach an approach to improving the cycling stability of lithium transition metal oxides is to include additional elements into the structure. (See column 3, lines 4-11.) Furthermore, they note that doping transition metal sites by divalent cations may create defect centers in the crystal and the defect centers may increase the oxidation state of the transition metal ions. The higher oxidation states created may, in turn reduce Jahn-Teller distortion effects which is postulated to enhance the electrochemical properties of the material. (See column 5, lines 50-66.) Although Kumta et al. discuss doping effects in terms of crystal structures with a R3m symmetry, one of ordinary skill in the art would the advantages of doping would similarly apply to other crystal structures. It would have been obvious to one of ordinary skill in the art to include divalent cations on transition metal sites of the Shackle cathode materials in order to create defect centers, increase the oxidation sate of the transition metals and thus improve electrochemical properties of the cathode materials, as is taught by Kumta et al.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gao et al., US Patent 6,277,521 discloses advantages of partially replacing transition metals in lithium metal oxides with foreign metal cations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (571) 272-1284. The examiner can normally be reached on Mon - Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Carol Chaney  
Primary Examiner  
Art Unit 1745

17 May 2004